



Document title	Document 3 - Properties of indicators for the integrated assessment
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Background

To evaluate and be able to discuss the needed properties of an integrated biodiversity assessment tool, knowledge about the type of data and integration/aggregation procedures is needed. This document provides information on some proposed properties of HELCOM Core and pre-core biodiversity indicators that are to be taken into account when planning the capabilities needed of the biodiversity assessment tool.

Action required

The workshop is invited to use the information, including the proposed points for discussion, when proposing how the HOLAS II biodiversity assessment tool should be developed.

Properties of indicators for the integrated assessment

To evaluate and be able to discuss the needed properties of an integrated biodiversity assessment tool, knowledge about the type of data and integration/aggregation procedures is needed. This document provides information on some proposed properties of HELCOM Core and pre-core biodiversity indicators that are to be taken into account when planning the capabilities needed of the biodiversity assessment tool.

A total of 16 core and 2 pre-core indicators linking to biodiversity descriptors (MSFD descriptors 1, 4 and 6) presently considered to be included in the assessment were evaluated (see Annex I). In addition, countries have expressed the wish that the tool should as far as possible also be able to encompass additional indicators to these (Outcome of HOLAS II Biodiv 1-2015). Examples of additional indicators are not included here and it has been assumed that these would be based on similar properties as the Core indicators.

Type of GES is applied

Among the evaluated indicators several approaches of defining GES have been proposed (Annex I). Most common (10 out of 16) is the approach of a GES boundary, where being above/below indicates GES. Trends are used in two indicators, where an increasing/declining trend indicates GES. One indicator potentially uses an interval approach, where a too low or too high value means being outside of GES. In four indicators either a boundary or a trend approach, or a combination of the two, are used to assess GES, depending on the availability of baseline data or indicator type. To include all core indicators and to get a comprehensive assessment, the planned assessment tool needs to cope with different GES-assessment types.

Number of parameters

The number of parameters considered in the indicators varies from 1-4 (Annex I). Some seal indicators include parameters for several species, and the coastal fish indicators functional groups in composed of two components representing different functional groups. The indicators which are composed of several parameters could be aggregated into one GES assessment before entering the tool, or the different parameters could be inserted individually and aggregations treated as part of the tool.

Spatial assessment units

The spatial assessment units of the core indicators vary from Baltic Sea scale to water bodies. Thus, a coherent procedure on how to spatially aggregate the information is needed.

Points for discussion:

- If an indicator has multiple GES assessed parameters, should the parameters be treated as separate indicators in the tool, or should a qualitative aggregation (e.g. based on the one out-all out principle?) be used? Should the aggregation be done in the tool or before entering the data?
- Would it be appropriate to use a qualitative approach and feed 'GES' or 'sub-GES' with estimated confidences (could be based on data, models, expert judgement) into the tool?
- How to aggregate the indicator information on spatial scales, within indicators, biodiversity components, MSFD criteria?

Annex I

Table describing the properties of HELCOM core and pre-core biodiversity indicators.

HELCOM Biodiversity Indicators	Indicator	Proposed GES type	GES direction	Number of parameters	Spatial assessment unit	Temporal assessment unit	Primary criterion	Secondary criterion	Biodiversity component	Notes
Abundance of coastal fish key functional groups	Core	boundary, interval, trend	above, in between, below, increasing trend, declining trend, no trend	2 (piscivores, cyprinids)	Sub-basin coastal waters	5 years	1,6	4,3	Fish	Different GES type depending on if baseline data is available
Abundance of key coastal fish species	Core	boundary, trend	above, below, increasing trend, decreasing trend, no trend	1-3 (perch, flounder, cod)	Sub-basin coastal waters	5 years	1,2, 3,2	4,3	Fish	Different GES type depending on if baseline data is available
Abundance of salmon spawners and smolt	Core	boundary	above	1	Sub-basin	1 year	1,2	4.1, 4.3, 3.2	Fish	
Abundance of sea trout spawners and smolt	Core	boundary	above	1	Sub-basin coastal waters	4-5 years	1,2	4.1, 4.3, 3.2	Fish	
Abundance of waterbirds in the breeding season	Core	boundary (interval)	above (in between)	2 (no of species, population size)	Baltic Sea (sub-basins when enough data accessible)	1 year	1,2	1.1, 4.3	Birds	
Abundance of waterbirds in the wintering season	Core	boundary (interval)	above (in between)	2 (no of species, population size)	Baltic Sea	1 year	1,2	1.1, 4.3	Birds	
Distibution of Baltic seals	Core (GES not agreed)	boundary	above	3 x 3 (grey seal, ringed seal, harbour seal; breeding distribution, moulting distribution, area of occupancy)	Sub-basin	1 year	1,1	1.2, 4.1, 4.3, 8.2	Mammals	
Number of drowned mammals and waterbirds in fishing gears	Core (GES only described, not quantified)	trend	declining trend	1	Sub-basin	1 year	annex III, 1.2, 1.3, 4.3	1.1, 4.1	Mammals, Birds	
Nutritional status of marine mammals	Core (not published)	boundary	above	2 x 2 (exponentially growing population, population at carrying capacity; by-caught, hunted)	Sub-basin	3-5 year	1,3	1.1, 1.2, 4.1, 4.3, 8.2	Mammals	Different GES depending on population status and sample type
Population structure of long-lived macrozoobenthic species	Core (GES not agreed)	interval or boundary?	in between	1	Sub-basin	5 years?	1,3, 1.6, 6.2	5,3	Zoobenthos	No GES established, different target species will be used in different sub-areas
Population trends and abundance of seals	Core	trend, boundary	increasing trend, no trend, above	3 x 2 (grey seal, ringed seal, harbour seal; population growth, abundance)	Sub-basin	1-10 years	1,3	1.1, 1.2, 4.1, 4.3, 8.2	Mammals	Different GES depending on population status
Proportion of large fish in the community	Core (GES not agreed)	boundary	above	1	Sub-basins open sea	1 year	4,2		Fish	
Reproductive status of marine mammals	Core (not published)	boundary	above	1-4 (grey seal, ringed seal, harbour seal, harbour porpoise)	Sub-basin	3 years	1,3	1.1, 1.2, 4.1, 4.3, 8.2, D10, D11	Mammals	
State of the soft-bottom macrofauna communities	Core (GES not agreed)	boundary	above	1	Sub-basin, coastal areas water body	1 year	1,6, 6.2		Zoobenthos	For coastal areas national WFD indexes are used, GES for open sea not yet established
White-tailed eagle productivity	Core	boundary	above	3 (productivity, brood size, breeding success)	Sub-basin coastal areas	1 years	8,2	1.1, 1.2, 1.3, 4.1, 4.3	Birds	
Zooplankton mean size and total stock	Core	multimetric (boundary)	above	2 (mean size, total stock)	Sub-basin	1 year	4,3	1,6	Zooplankton	
Distribution pattern and extent of benthic biotopes	Pre-core	boundary, trend?		3 (distribution, pattern, extent)	Sub-basin		1,4, 1.5, 6.1	1.1, 1.2, 1.6, 4.1, 4.3	Benthic habitats	No GES established
Lower depth limit of macrophyte communities	Pre-core	boundary	above	1	Sub-basin coastal water types		1,4	1.5, 1.6, 4.3, 6.1	Phytobenthos	Gaps in GES establishment